Fig. 1

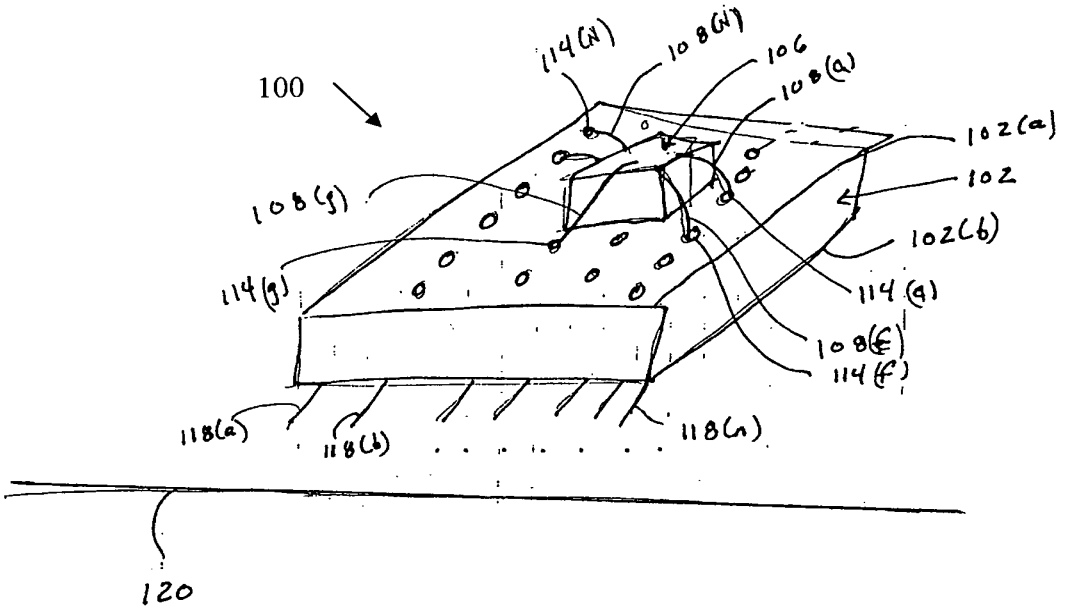

100
114(N)
108(N)
106
108(a)
102(a)
102
102(b)
108(g)
114(g)
114(a)
108(f)
114(f)
118(a)
118(b)
118(n)
120

Fig. 2

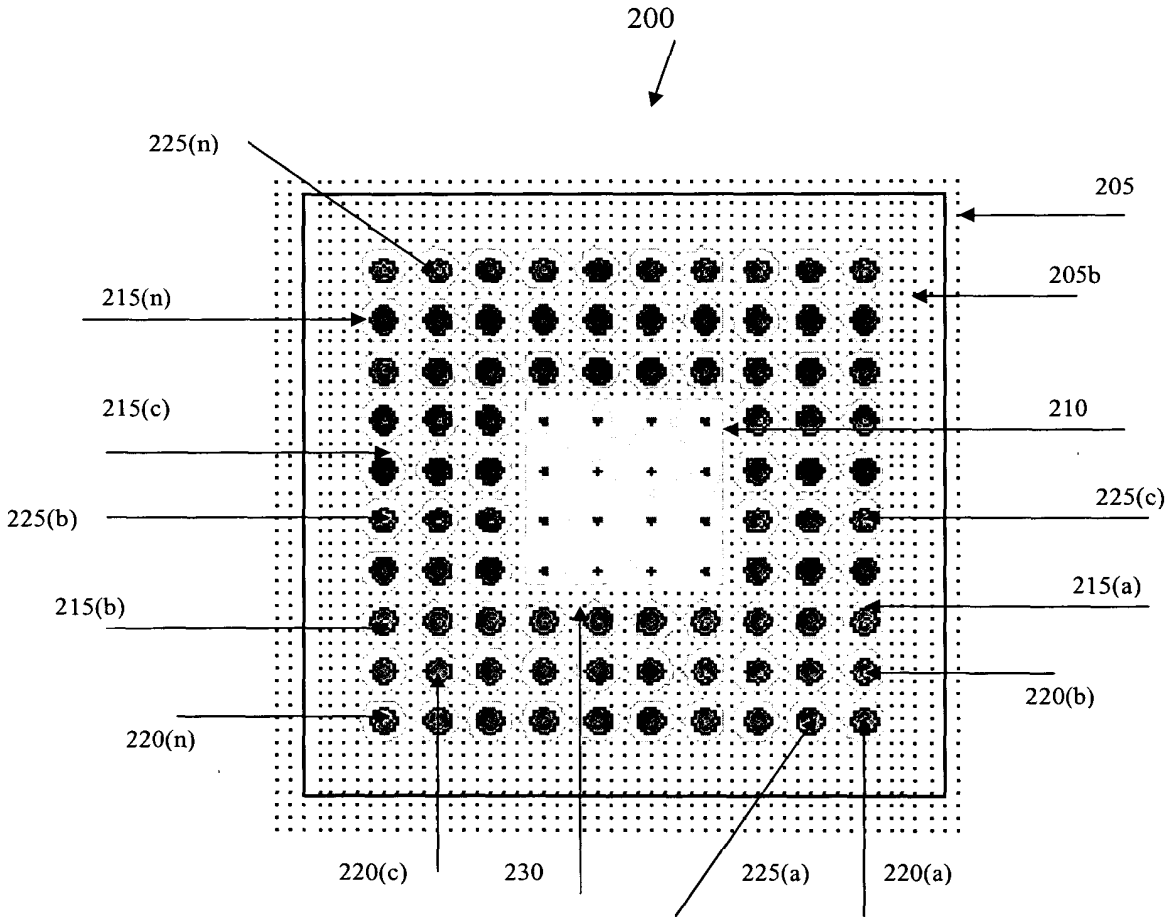

200
225(n)
205
205b
215(n)
215(c)
210
225(b)
225(c)
215(b)
215(a)
220(b)
220(n)
220(c)
230
225(a)
220(a)

Fig. 3(a)

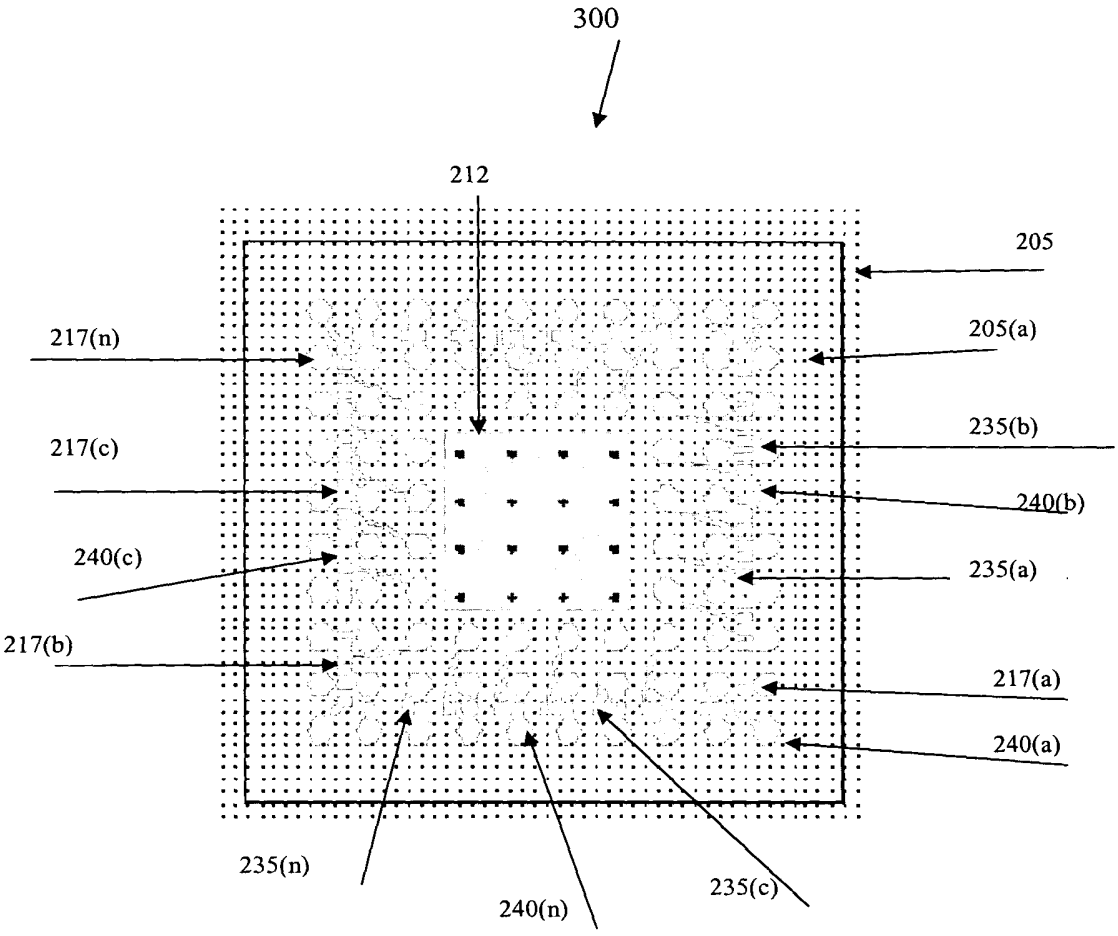

300
212
205
217(n)
205(a)
235(b)
217(c)
240(b)
240(c)
235(a)
217(b)
217(a)
240(a)
235(n)
240(n)
235(c)

Fig. 3(b)

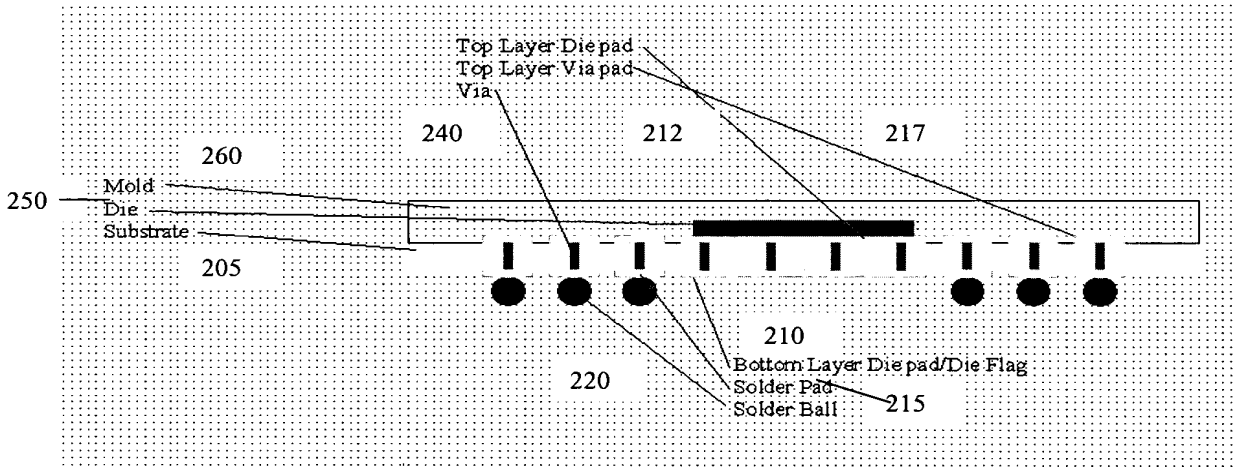

Top Layer Die pad
Top Layer Via pad
Via
240
212
217
260
250
Mold
Die
Substrate
205
210
Bottom Layer Die pad/Die Flag
Solder Pad
Solder Ball
215
220

Fig. 4

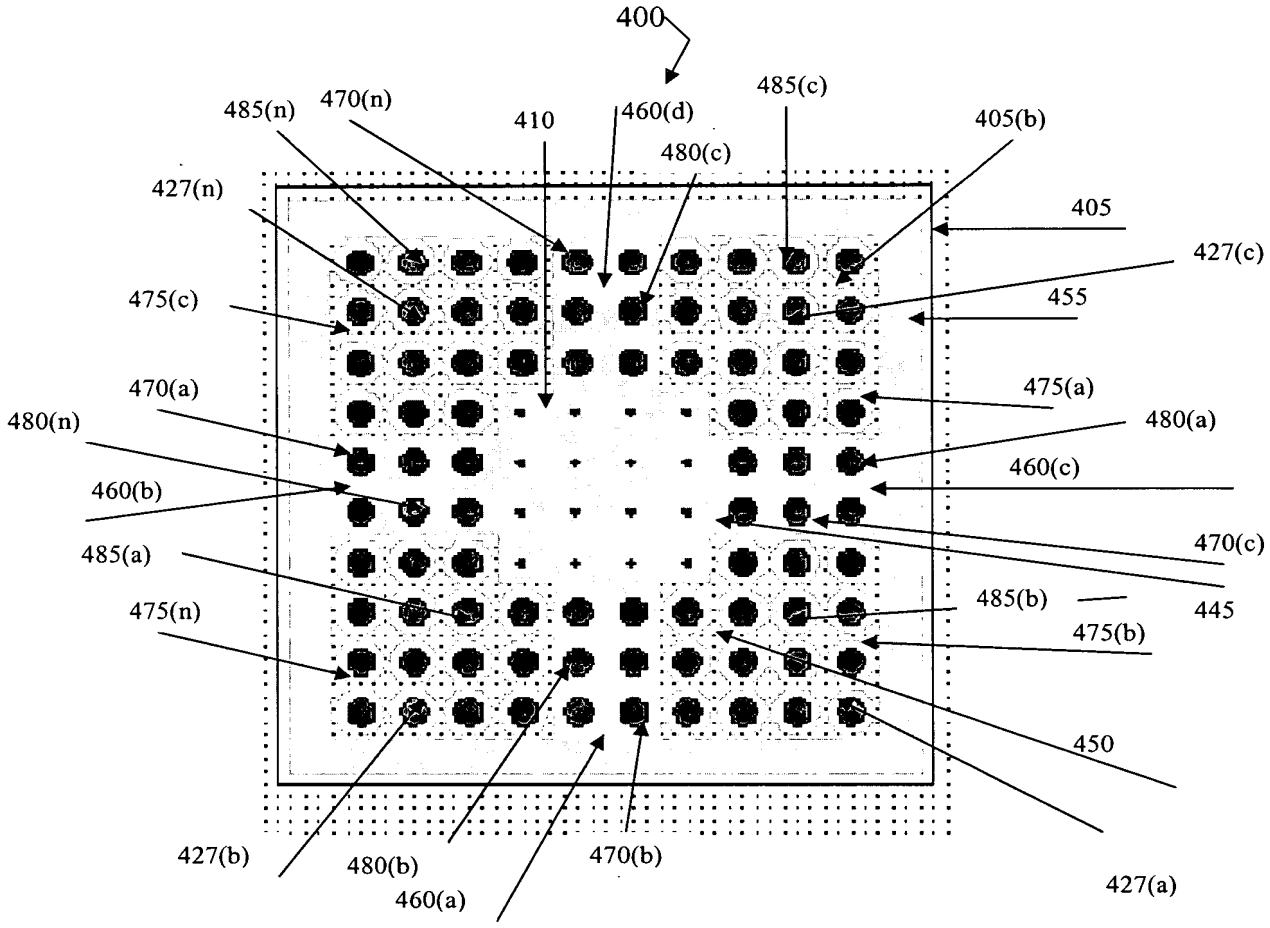

400
485(n)
470(n)
410
460(d)
485(c)
405(b)
480(c)
427(n)
405
427(c)
475(c)
455
470(a)
475(a)
480(n)
480(a)
460(b)
460(c)
470(c)
485(a)
445
485(b)
475(n)
475(b)
450
427(b)
480(b)
470(b)
460(a)
427(a)

Fig. 5

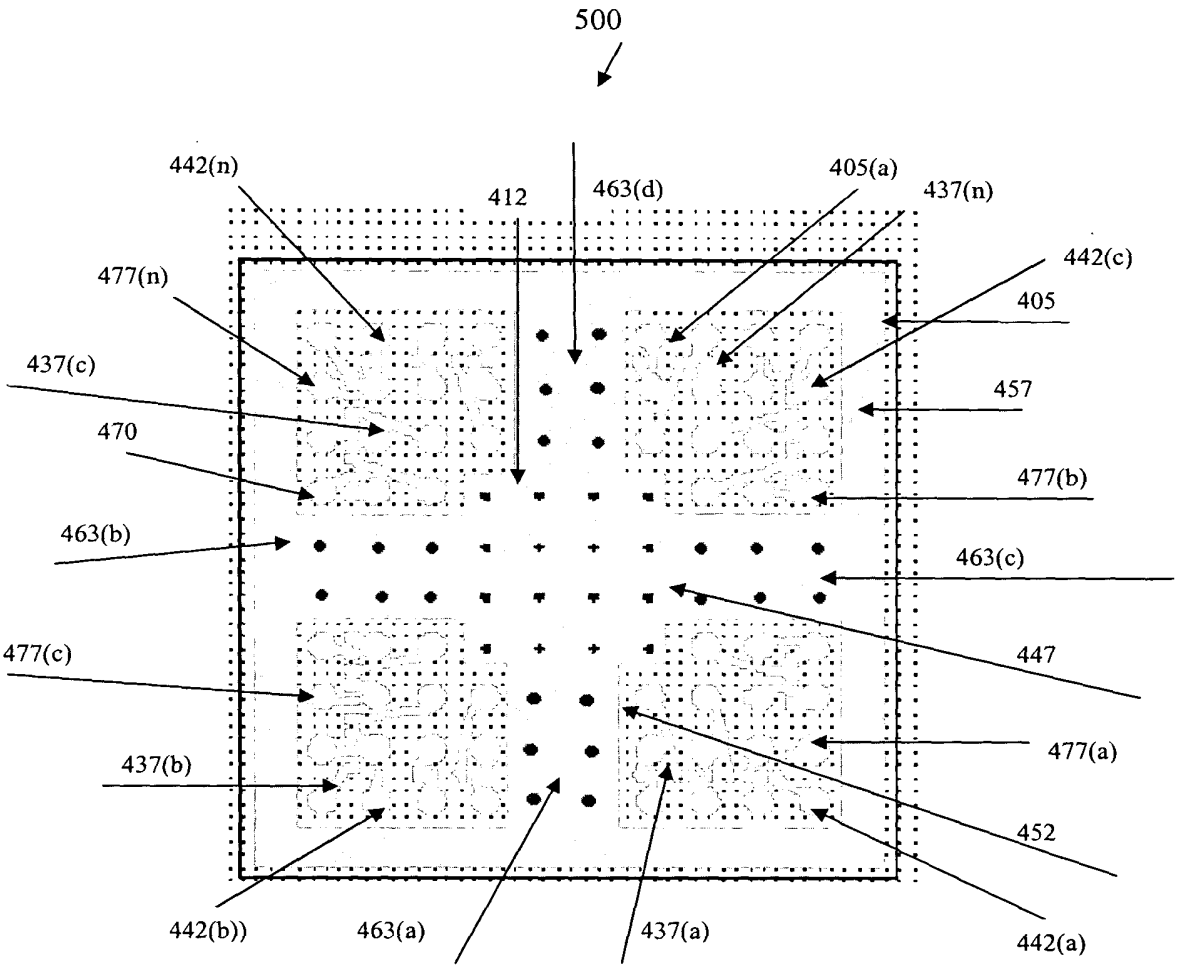

500
442(n)
412
463(d)
405(a)
437(n)
442(c)
477(n)
405
437(c)
457
470
477(b)
463(b)
463(c)
447
477(c)
477(a)
437(b)
452
442(b))
463(a)
437(a)
442(a)

Fig. 6

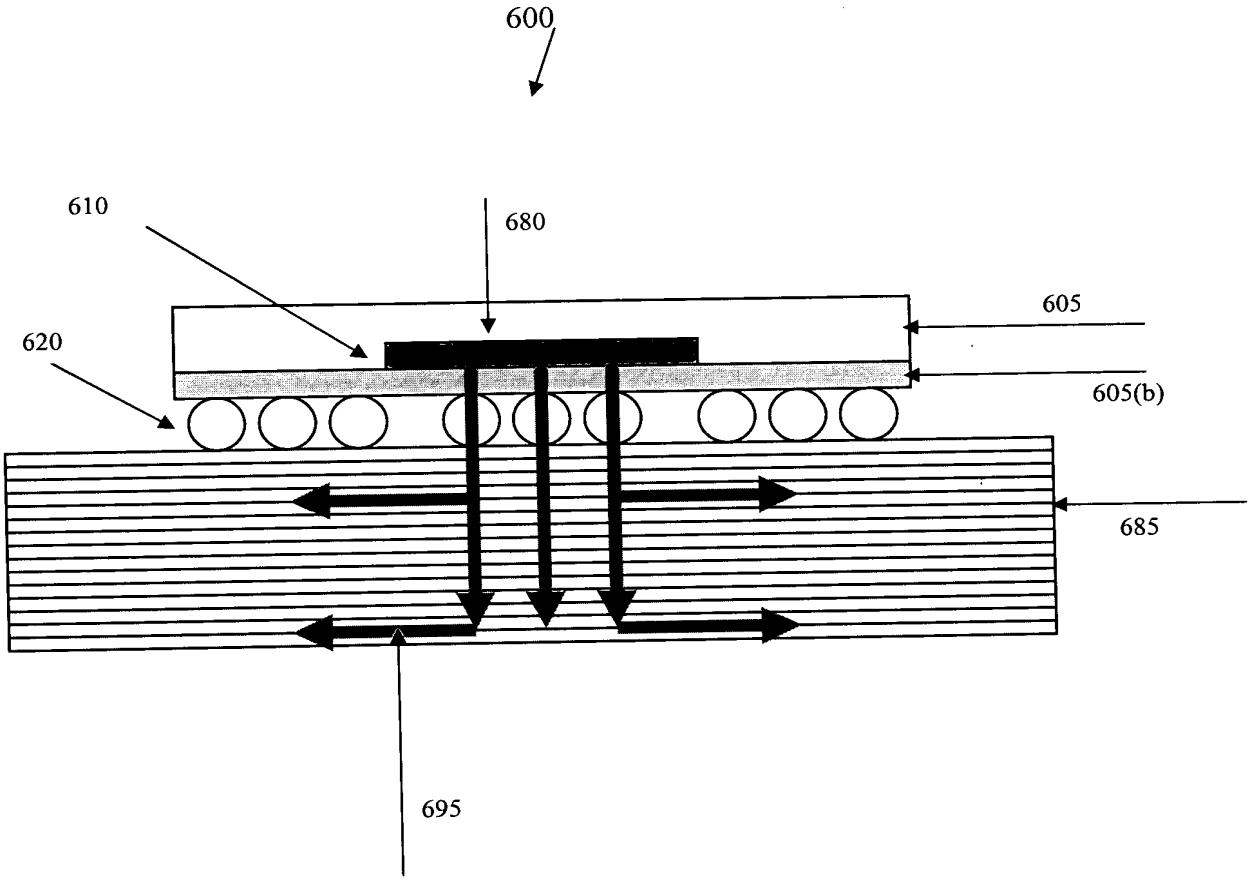


Fig. 7

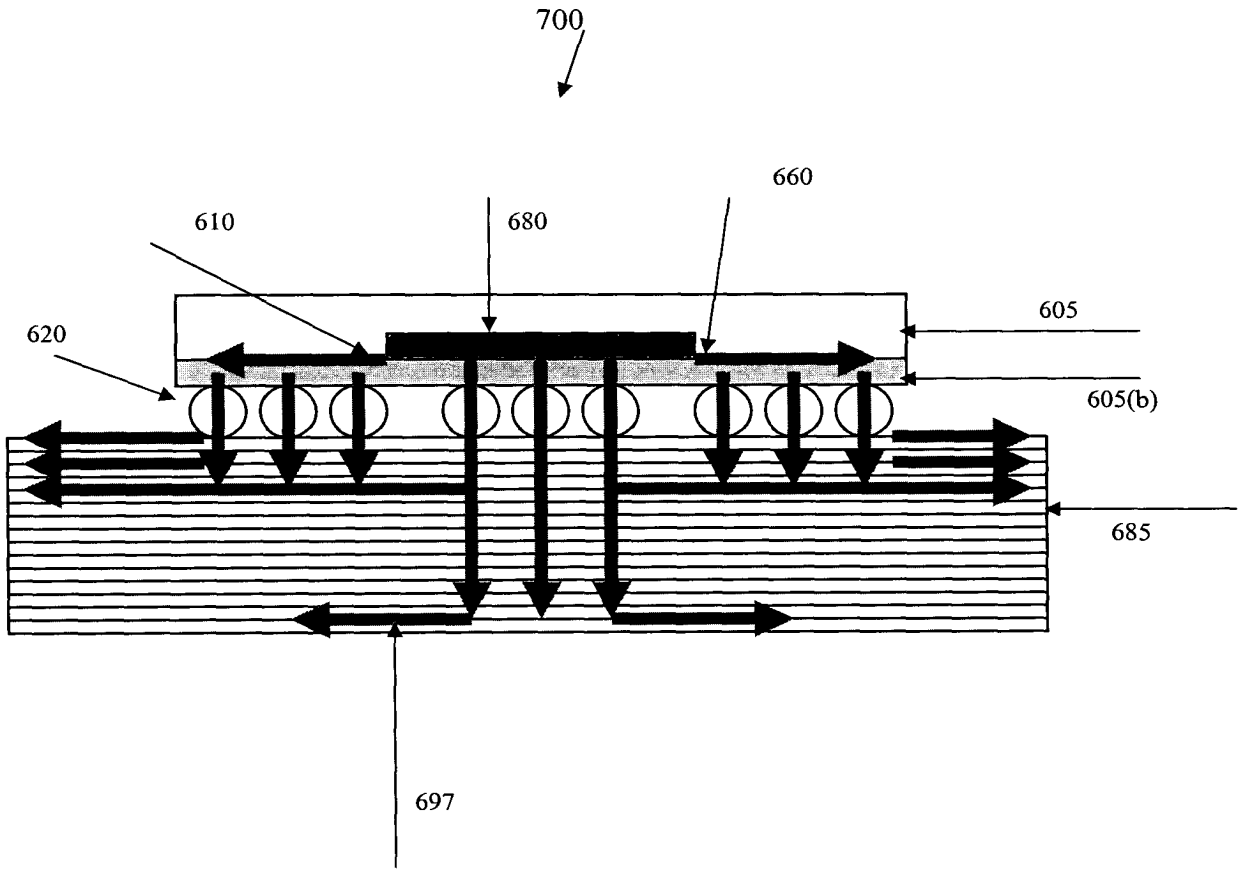


Fig. 8

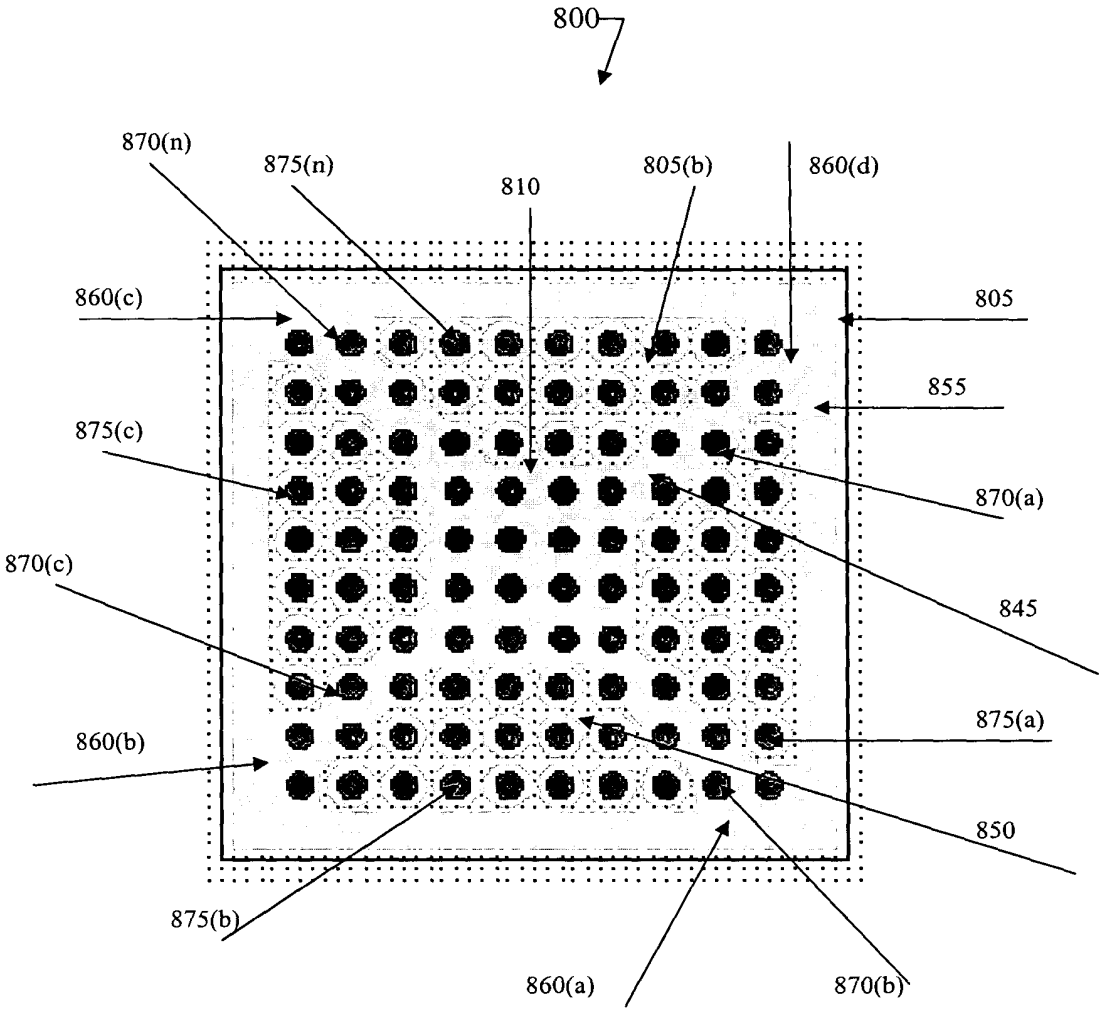

800
870(n)
875(n)
810
805(b)
860(d)
860(c)
805
855
875(c)
870(a)
870(c)
845
875(a)
860(b)
850
875(b)
860(a)
870(b)

Fig. 9

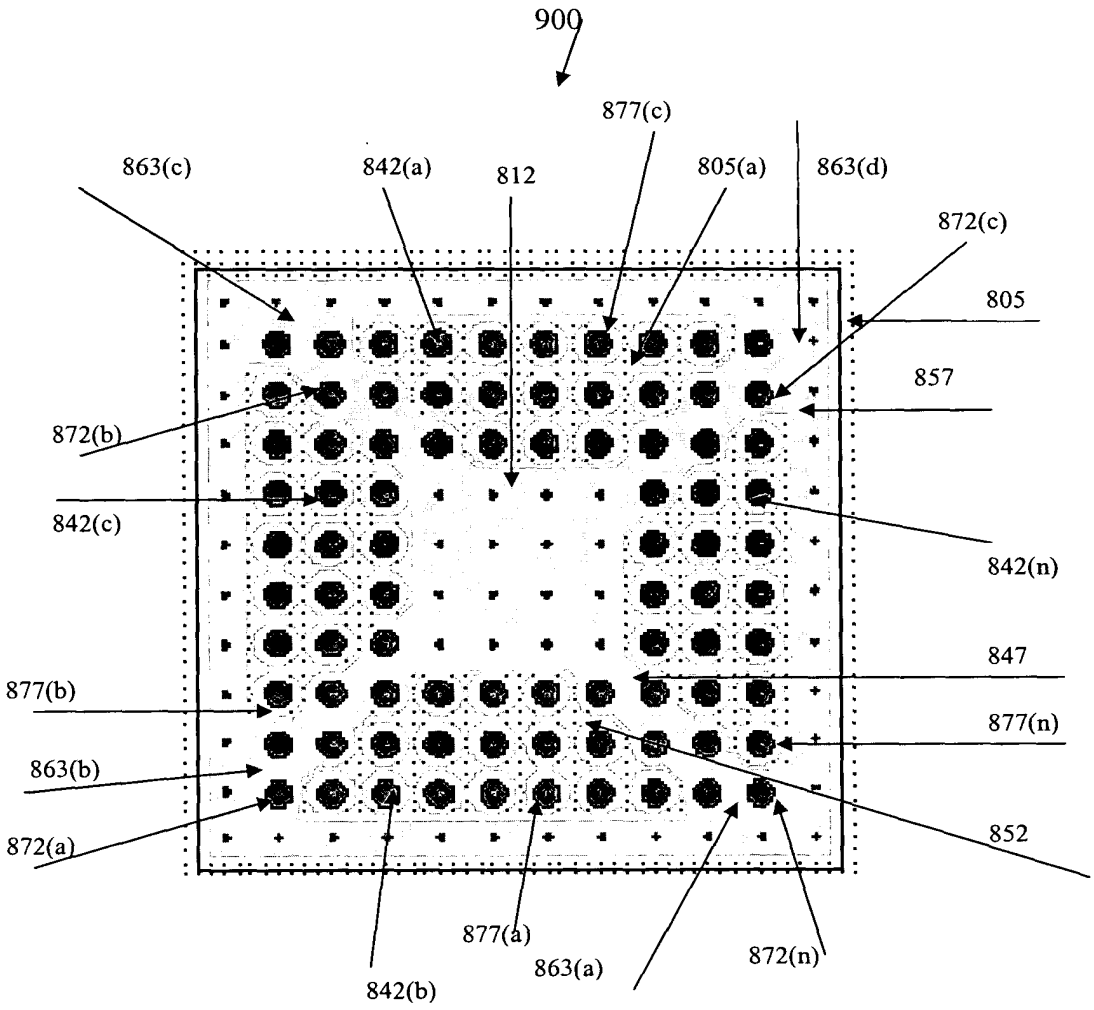

900
877(c)
863(c)
842(a)
812
805(a)
863(d)
872(c)
805
857
872(b)
842(c)
842(n)
847
877(b)
877(n)
863(b)
872(a)
852
877(a)
863(a)
872(n)
842(b)

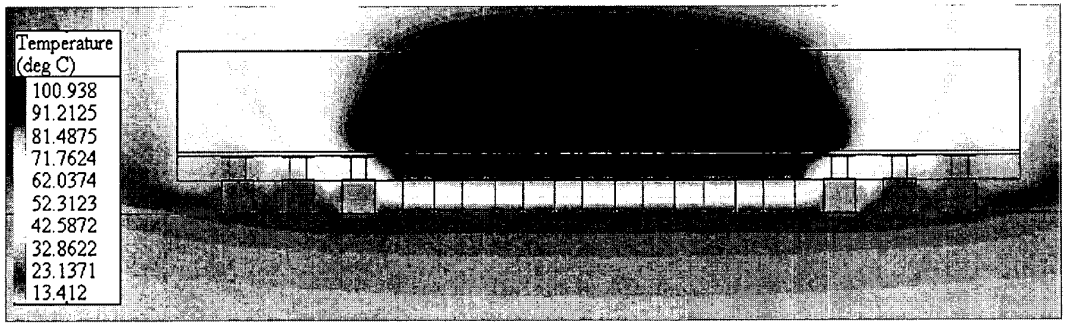
Fig. 10

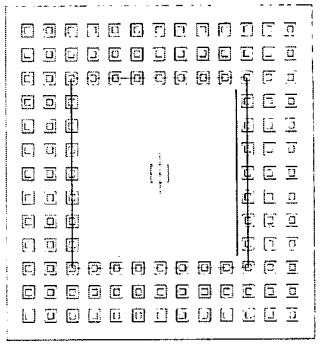
Thermal Bar Substrate Simulation case

1000

PWB cooling principle (no thermal ball option), normal:

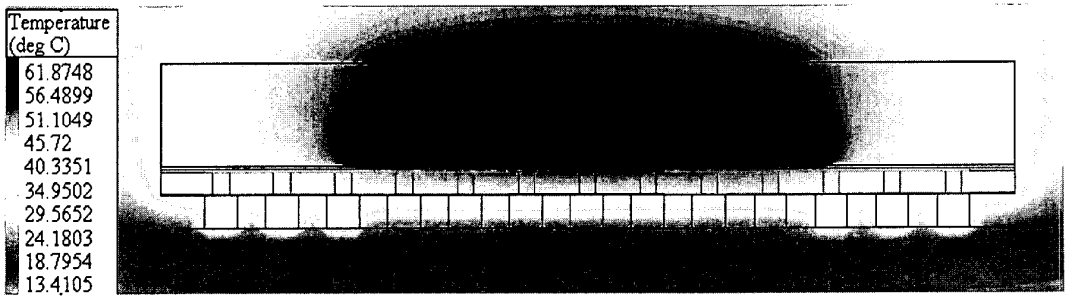
1010

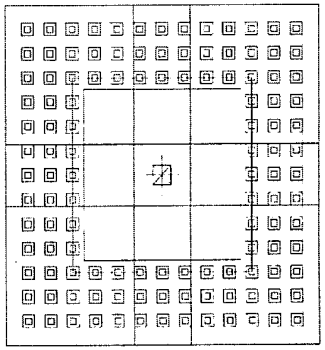




PWB cooling principle (no thermal ball option), TB:

1020





~ 40 % thermal performance decrease in package level